

# AMATEUR RADIO

OCTOBER  
1949

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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# AMATEUR RADIO

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**EDITORIAL**

## THE AMATEUR'S CODE

Many years ago, somewhere about the time the A.R.R.L. came into existence, some very wise men laid down a code of ethics for the Radio Amateur. The times and techniques have changed, but one thing remains unchanged—the Amateurs' Code. For the benefit of those who have forgotten and the edification of those who don't know it, we present it in all its brevity and truth.

**1—THE AMATEUR IS GENTLEMANLY.**

He never knowingly uses the air for his own amusement in such a way as to lessen the pleasure of others. He abides by the pledges given by the W.I.A. on his behalf to the public and the Government.

**2—THE AMATEUR IS LOYAL.**

He owes his Amateur Radio to the W.I.A. and the I.A.R.U., and he offers it his unswerving loyalty.

**3—THE AMATEUR IS PROGRESSIVE.**

He keeps his station abreast of science. It is built well and efficiently. His operating practice is clean and regular.

**4—THE AMATEUR IS FRIENDLY.**

Slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance and co-operation for the broadcast listener; these are marks of the Amateur Spirit.

**5—THE AMATEUR IS BALANCED.**

Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school or his community.

**6—THE AMATEUR IS PATRIOTIC.**

His knowledge and his station are always ready for the service of his country and his community.

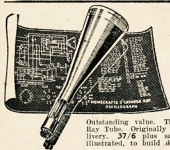
The above principles should need no clarification—it is there in all its stark truth. Read and inwardly digest. If your memory is good, remember well—if it isn't, cut this out and keep it on your operating desk.

—W. T. S. M.

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SUPER METER BARGAIN. English Metropolitan Vickers 0-1 d.c. Moving Coil, 0-1 Ma. Meters with 2 in. scale. Brand new in original cartons, only 29/6.



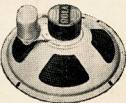
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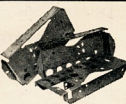
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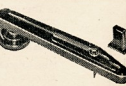
The new Palee VUT2 Valve and Circuit Tester. This outstanding instrument is now available for immediate delivery. 16,000 ohm per volt. Will test 800 types of valves. Price complete £33/15/- plus sales tax. Easy terms, £7/10/- dep., 13/6 weekly.



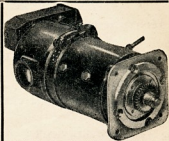
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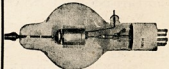
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F.M.A. Type F (retorted) Jewels, wide vision type with nut and screw for 2 in. hole mounting, 1/9 each. With back loading pilot light assembly, 3/9 each. Front loading type, 6/- each. Colors: Red, Green. Finish: Nickel Plated.



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# Compact 75 Watt Modulator

A & R Modulators, Type M2-75 and M3-75, are complete units (less power supplies) designed for voice frequency modulation of a transmitter, and each is capable of 75 watts audio output at the secondary of the modulation transformer when terminated in a suitable load, and used in conjunction with adequate power supply equipment.

The units are available ready for use (less valves and cabinet), assembled, wired and tested, and any or all of the major components may be purchased separately. The chassis, panel, handles, and brackets, etc., are also supplied separately in sets.

Both types are similar, except that M2-75 includes a two stage pre-amplifier for use with a high impedance microphone and M3-75 is provided with a 600 ohm line input transformer (no pre-amp.) requiring an input level of 1 milliamp or 0.75 volt (zero d.b.m.) for full output.

Each unit of either type includes a negative peak clipping circuit with a special filament transformer for the valve.

The modulator circuit is based on information appearing originally in R.C.A. "Ham Tips," re-printed in "Amateur Radio, August, 1948, and "Radio-News," July-August, 1949, showing a method of using 807 valves as zero bias Class B modulators. Tests have proved that this system produces the results

Here are the details of a compact 75 Watt Modulator, based on the circuit, of 807s as zero bias Class B triodes, that appeared in "Amateur Radio," August, 1948. A & R Electronic Equipment Co. Pty. Ltd. advise that they are now manufacturing Modulation Equipment suitable for use by Amateurs, and provide the following information, illustrations, circuit, etc.

tions were made to the original circuit in order to produce the required frequency response. The pre-amplifier provides sufficient gain for most high impedance type microphones.

Test results were as follows:—

The frequency response was taken overall from the input of the driver valve to the secondary of the modulation transformer, terminated in a resistive load of 10,000 ohms, and with 100 Ma. d.c. through secondary winding.

At full output of 75 watts the frequency response was within 1.5 db from 200 to 7,000 c.p.s. The distortion present at full output over the frequency range was quite low and aural tests

showed that the speech quality was excellent. The response of the pre-amplifier stages can be modified to suit a particular microphone by altering the coupling condenser values and in the case of a crystal microphone by reducing the resistor value from grid to earth on the first valve. It will be noted that the low frequency response falls off below 200 c.p.s., the transformers being designed to aid in this respect.

Reduction of the high frequency response and harmonics produced by the negative peak clipping valve is also desirable, and can be

achieved by the use of a filter or to a degree by a suitable by-pass condenser.

It is well known that speech waveform is of a very peaky nature, and this means generally that either a low average modulation level must be tolerated, or some means must be provided to overcome this limitation. Without suitable precautions, an increase of the audio gain above a certain level will cause some of the higher negative voltage peaks at the modulation transformer secondary to exceed the final r.f. stage d.c. plate voltage. This will reduce the effective voltage acting on the r.f. stage to zero for the period of time that there is no positive voltage applied, thus causing discontinuity of the carrier power and so-called splatter takes place.

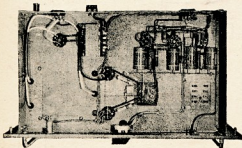
Volume compression and a.m.c. circuits reduce the peaks and increase the average modulation, but the time constants normally used allow high speed

speech peaks of some frequencies to pass through to the modulator output circuit. The solution to this is to add a high level negative peak clipping valve with a low pass filter following.

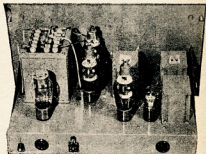
The negative peak clipping circuit is included in the modulator so that those who use the equipment will be provided with the basis for possible improvement of their transmissions if they desire a high average modulation level with minimum interference to other stations.

It is not claimed that the best results will be possible without a low pass filter between the modulation transformer and the r.f. final stage of the transmitter, although useful suppression of high frequency response can be obtained by providing as large a capacitance as possible (2,000 v. w.) in the position marked CX in the circuit. A filter, if used, will carry the final stage d.c. current and the audio frequency currents. The condensers and reactors should be able to withstand the maximum working voltage continuously; i.e., approximately 2,000 volts r.m.s. at full audio output and 1,000 volts d.c. It is best to use "air core" reactors for the reason that less trouble will be experienced from noisy operation under heavy modulation.

Details of the design and operation of suitable filters, and of other methods of reducing the r.f. channel width will be found in "QST," April, 1948; R.S.



Underneath view of the Unit.



Rear view of the Modulator Unit.

claimed and does this without the usual complications of bias and screen voltages, etc.

Considering the popularity and low price of 807 valves, this circuit has much to commend it. In designing the mechanical layout of the modulator, it was apparent that the most useful and universal arrangement would be a standard 19" x 10 1/2" rack mounting panel and chassis, as this can also be mounted in a metal cabinet, which is available for this panel size.

External finish of the equipment is grey brocade, with chrome plated handles and panel screws.

A complete modulator unit with pre-amplifier was designed, built and tested as a prototype, and all relevant tests were made including actual operation with a 100 watt transmitter. The performance of the modulator was very satisfactory, after one or two modifica-

G.B. Bulletin, February, 1949, and in other publications.

The following description and details of operation of the M2-75 modulator apply also to the M3-75 unit, allowing for the difference previously explained.

Type M2-75 modulator includes pre-amplifier stages, and is intended for use with a high impedance microphone. The overall gain is more than sufficient for full output using a D104 type crystal microphone. A 6J7 metal valve was used in the original unit, and should this type be difficult to obtain, a 6J7G would be quite suitable if provided with a metal shield to completely enclose the valve, grid resistor and r.f. filter circuit. A single ended valve, such as a 6S3J is not recommended. The second valve is a high gain triode type 6SQ7, and this valve and the following valves are readily obtainable.

It was found that a single 807 valve as a tetrode provided adequate driving power for the modulator valves, when used as shown in the circuit diagram. Negative feedback was not necessary, as the distortion visible on the c.r.o. screen was not excessive at 75 watts output, over the voice frequency range for which the unit was designed.

The driver transformer is a type specially designed for use in this circuit, but the modulation transformer is a semi-universal type suitable for use with many other Class A, AB<sub>1</sub>, AB<sub>2</sub>, or B circuits, using such valves as 807s, 809s, 830Bs, etc. The maximum signal modulator valve plate current should not exceed 150 Ma. d.c. per side of c.t. on the primary side, and the d.c. current through the secondary should not exceed 150 Ma. A maximum d.c. voltage of 1,000 may be applied to the primary and/or secondary windings. The transformer is fitted with a spark gap to provide protection against excessive peak voltages which may occur in the event of loss or reduction of load during transmitter adjustment or tuning operations.

This gap should be carefully adjusted so that during full modulation the points

are as close as possible, but do not spark over under normal peaks.

The modulation transformer has been carefully designed and is not likely to break down with normal use if the maximum voltage and current ratings are not exceeded. The primary and secondary impedance ranges should be suitable for most modulator and transmitter valve combinations usual with a transformer of 75 watts rating.

#### MODULATION TRANSFORMER IMPEDANCES

PRIMARY	SECONDARY
1 H.T.-4	7-8 4,000 ohms
2-2 3,800 ohms	7-9 5,000 "
3-3 5,000 "	7-10 6,000 "
4-4 6,800 "	7-11 8,000 "
5-5 8,500 "	7-12 10,000 "
6-6 10,000 "	

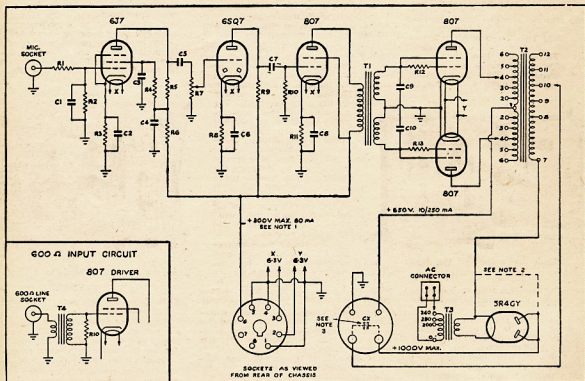
It is necessary now to point out that full power output with low distortion from this or similar audio equipment, is not possible without power supplies having the necessary voltage regulation

under minimum to maximum signal conditions.

The power supply for the pre-amplifier and driver stages should provide 275/300 volts at about 80 Ma. with sufficient filament windings for all valves (except the 5R4GY). It is advisable to check the filament voltages at the valve sockets, as low voltage, particularly on 807 valves, is to be avoided.

The power supply for the modulator valves is most important, and should be a separate unit with good regulation. The voltage output should be approximately 850 volts at the no signal current of 10 Ma., and should not drop to less than about 600 volts if full output of 75 watts is required, the maximum signal current for both valves being approximately 220 Ma. It is possible to use up to 750 volts (maximum at no signal) on the valves, and obtain the power output with poorer power supply regulation. A power supply with good regulation and additional current capacity may also be used for both the modulator valves and the Class C final r.f. amplifier.

(Continued on page 5)



- T1—Type IF588 A & R Transformer.  
T2— " MT15 " "  
T3— " PT1516 " "  
T4— " IT563 " "

- C1—50 pF. Mica.  
C2, C6, C8—10 uF. 40 v.p.  
C3—0.1 uF. 200 v.w.  
C4—8 uF. 525 v.p.  
C5, C7—0.01 uF. Mica.  
C9, C10—400 pF. Mica.  
CX—2,000 volt working, see text.

- R1—20,000 ohms, 1/2 w.  
R2—5 megohm, 1/2 w.  
R3—1,500 ohm, 1/2 w.  
R4—1.5 megohm, 1/2 w.  
R5—0.25 megohm, 1/2 w.  
R6—50,000 ohms, 1/2 w.  
R7—0.5 megohm pot.  
R8—5,000 ohm, 1 w.  
R9—0.25 megohm, 1 w.  
R10—0.5 megohm, 1 w.  
R11—225 ohm, 3 w.  
R12, R13—20,000 ohm, 1 w.

#### NOTES

1. If voltage exceeds 300, reduce with a resistor and by-pass with an 8 uF. condenser.
2. Short circuit plates to filament if negative peak clipper is not required.
3. Up to 0.01 uF. by-pass may be required (inc. r.f. by-pass).

# Modifications to the ARS Receiver

BY L. W. JOHNSON\*

The original parts from an AR8 are re-built on an aluminium chassis in the writer's case employing the h.f. unit only. All values of condensers, resistors, etc., are the same as original and the wiring is copied from the R.A.A.F. circuit.

The modifications effected are as follows:—

1. A 6V6 output tube has been added after the final (diode-triode) stage.

2. An 0-10 Ma. meter, with a low resistance shunt (an old rheostat), is inserted in the cathode circuit of the r.f. and mixer tube, making an effective S meter. (An 0-1 Ma. would be more effective still.)

3. Band spread is effected by the addition of three 2-plate midget condensers, ganged, in parallel with the main tuning condenser.

By disconnecting one 5 pF. trimmer from the oscillator section of the gang and bending the small band spread condenser plates, good tracking can be obtained: ordinary midget 3-plate condensers, with one fixed plate removed, being used. This is sufficient to cover the 20 metre band, but two bites are needed for 40 metres.

It was found that it is very hard to track the set correctly again if trimmers are used. It apparently upsets the balance very badly.

The band spread condensers are mounted very close to the gang, in the writer's case, being bolted onto the actual frame. The drive to the dial is accomplished by two sprockets and some Mecano chain. There are two sprockets in the AR8 suitable for this purpose—they connect the tone control to another control in the original version.

To anyone re-building AR8s, the following suggestions are made to avoid some common pitfalls.

Don't get the i.f. transformers mixed. They also contain condensers and resistors as well as coils. Don't try and re-build the coil units unless it is absolutely necessary. They are a real headache. The writer's coil unit is mounted on one end of the chassis with the leads to the i.f.s., h.t., etc., coming through the bottom of the chassis.

If any alterations, such as re-arranging of parts, etc., takes place, get a good oscillator to line up on. You can be 100 Kc. out on the i.f.s. and still get good results, but lined up properly makes a big difference. You can not line an AR8 up by ear and get the best from it. The i.f. frequency is 755 Kc.

300 volts h.t. from an ordinary power pack is quite satisfactory for the h.t. supply with no excessive heating.

When all boiled down the circuit is quite conventional and a good receiver for Amateur use if a little band spread is added.

The AR8 series Disposals Equipment has been very popular with Amateurs throughout Australia, due mainly to its convenient size and convertibility, and these suggested conversion methods are submitted to help the new Amateur who want a cheap, reliable receiver for use on the low frequency bands.

BY R. TORRINGTON,† VK3TJ

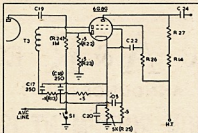
Replaced V5 (6J7) with 6V6 and changed bias resistor. Removed T4, C30 and C31, as speaker used (an electro-dynamic) had speaker transformer attached.

Re-wired all heaters for 6 volt operation, deleting the dropping and balancing resistors, also chokes and filter condensers (R11, R32, L2, C110, C32, C34, etc.).

Re-ground the conductors leaving the receiver into power supply socket, thereby leaving the junction box socket vacant. A plate was made for this hole and the telephone jack fitted in lieu of junction box socket.

Removed T5, microphone transformer, and joined ends of R14 and R27.

Removed V6 (6X5), associated resistors, and wiring.





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★ Square Flares for 8 in. Speaker, 40/-.

★ Speaker Mono Flares for outside P.A. work. Suit 10 in. Speaker, 47/6 each NET.

★ 4 uF. 600 volt Tubular Condensers, 1/3 each net.

★ Amplifier Cases, 53/6 each.

★ 350 Ma. 385/385 Power Transformer, 76/-.

★ Full range Agilis Insulators, stand off and feed through, available.

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# ELECTRONIC A & R EQUIPMENT

## ANNOUNCEMENT!

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**MODULATOR Type M2-75** is a complete unit with Standard 10 1/2" Panel and Chassis and including high impedance microphone pre-amplifier, driver stage, 807 triode Class B final stage, and a negative peak clipping circuit. It is capable of 75 watts output in the frequency range 200-7000 c.p.s. when used in conjunction with suitable power supplies.

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# AMATEUR EMERGENCY WORK DURING KEMPSEY FLOODS

By CRIEFF RETALLICK, VK2XO, and HUGH STITT, VK2WH

For the third consecutive month, N.S.W. Amateur Radio Stations have supplied emergency communication from isolated areas, when normal services failed. The third occasion was during late August when Kempsey was devastated by flood waters. Reports on the previous activity have been given in this magazine. Again Amateur Radio added to its previous fine record of public service.

The first request for Amateur co-operation was made by the authorities on the evening of Friday, 26th August, when Crieff Retallick VK2XO, of Raleigh, was requested by P.M.G. Technicians, Mr. Vince MacDougall of Kempsey and Mr. Eric Spring of Grafton, to stand by and contact the P.M.G. Emergency Flood Station at Lawrence VL2JA on 5390 Kc. The first request was made at 2100 hours and contact was established cross-band from 3.5 Mc. at 2330 hours. Tests were carried out and instructions given to VK2XO.

Saturday 27th saw Doug Glik VK2SH and VK2XO in contact at 0730 hours on 7 Mc. VK2XO reported that the a.c. supply to Kempsey had failed and that high tension poles had been carried away by flood waters. Enquiries were also made about the whereabouts of VK2ZS and VK2ASF, Kempsey's most active Amateurs. VK2SH informed him they had left for Sydney. VK2SH from then on monitored VK2XO's frequency.

As arranged at 0900 hours, VK2XO and VL2JA made contact and continued on half hourly schedules. The flood position at Kempsey had deteriorated and it was known that Kempsey was completely isolated and out of contact by telephone. Incidentally all areas north of Kempsey were out of communication with the south.

A general call for assistance was transmitted on 7 Mc. by VK2XO, as was a similar message relayed over National Station 2NR. Within a few minutes VKs 2ARE, 2JK, 2ARY, 2UR, 2UC, 2TB, 2CU, 2ADX, 2SH and others were all standing by for emergency work with VK2XO acting as control station. VK2AA, official P.M.G. Station, called on the net frequency and requested that traffic be taken for Bellingen and area, and Harry McKine VK2ARY of that town relayed VK2AA of the telegrams. Traffic between these two stations was handled throughout the day.

A request was made from VL2JA that VK2SH endeavour to establish telephone contact with Kempsey, but Doug reported that this was impossible at this stage. Earlier at 0800 hours, Kempsey Post Office reported two feet of water in the telephone exchange and from then on no news had been received.

VK2AER broke into the net to inform VK2XO that two battery operated portable radio stations were housed in the Forestry Department's office at Kempsey. This information was relayed on to VL2JA by VK2XO.

First news from stricken Kempsey came via Amateur Radio when at 1330 hours Chas Peddell VK2KN opened on

7000 Kc. and broadcast a QST for the urgent despatch of Army Ducks to the area for rescue work. VK2KN stating he had no receiver operating. This QST was received by VK2XP of Dubbo who relayed the message to the local police, he also informed the net of the position giving VK2KN's frequency. VK2XO immediately broadcast a request that Amateurs listen out for VK2KN in Kempsey. By 1415 hours a receiver was in operation at VK2KN and Chas established contact with Bill Allworth VK2OE of Maclean and the request for Army Ducks was relayed to VL2JA from VK2OE.

The 7 Mc. band, by this stage, was a hive of activity. Police messages, telegrams were flashing back and forth and Amateurs were performing valuable work.

Five channels operated from the flood area; VK2KN from Kempsey, VK2ARY from Bellingen, VK2XO from Raleigh, VK2DX and VK2DZ using an FS6 and operating for the Macksville Police and at Clybucca Mr. N. C. Harrison of the Dept. of Civil Aviation operated a No. 11 set lent by VK2ADN to a relief party which left for Clybucca from Coff's Harbour.

It is extremely difficult, if not impossible, to clearly trace the events in emergency communication that happened during the remainder of Saturday. Some of the work performed included the following: VK2CU monitored VK2KN's frequency and passed information to VK2XO for relay to VL2JA. VK2AA established communication with the R.A.A.F. Catalinas flying over Kempsey and informed VK2KN that the aircraft was operating on 4495 Kc. Chas was able to contact the planes flying overhead and greatly assisting in the direction of relief work. VK2AQK passed news to the R.A.A.F. VK2KN later in the afternoon requested permission for the handling of press; VKs 2AKA, 2GC and 2WH assisted and VK2AA obtained permission.

The first press message of 384 words was cleared after great difficulty. VK2KN was only using very low power and many stations assisted to fill in the gaps in the message. Hugh Stitt VK2WH at Forbes seemed to receive VK2KN best of all and provided many fills. Nearly three hours elapsed before the message was finally cleared. Many telegrams were also handled between VK2KN and VK2AA. VK2KN finally closed at midnight after a contact with VK2SH.

The greatest problem during the evening was that of commercial interference from two ZK stations. VK2KN operated on 7,000 Kc. and the two ZK stations were about a kilocycle outside the band. The resultant din can easily be imagined. At one stage Chas tried c.w. and as he had no key tapped two wires together. The keying was excellent under the circumstances, but the chirp from the emergency equipment made it impossible to copy.

VKGS, the Newcastle Police Station on 4,400 Kc., was also contacted by VK-

2XO and stated that the Army Ducks were standing in readiness for departure. These Ducks left for Kempsey during the afternoon. Jack Brand VK2ADX earlier during the day informed VK2XO of the availability of the Ducks. During Saturday evening the Ducks lost radio contact with their base and Amateur Stations were requested by b.c. stations to listen out on 6,235 Kc. and report progress on the trip north.

Sunday morning saw the emergency nets re-established at 0700 hours. VK2WH and VK2KN were in contact. VZSY, Mascot Aerodrome Station, notified they would stand guard on 7,000 Kc. VK2AA, VKGS and VK2XO all opened on that frequency. Message handling continued throughout Sunday, many stations again co-operating.

Other activity included: VK2SH handling police messages from Port Macquarie to VK2AA Sydney, VK2DX from Macksville requesting urgent supplies and Clybucca also opened up. Clybucca's first CQ was answered by VK2ARY and VK2AQK and with the assistance of VK2GC and VK2ASM messages were passed to official station VK2AA by phone. VK2FZ also assisted in the receiving of the messages from Clybucca.

By evening the position in the flood area had improved and at 1745 hours VK2AA reported no outstanding traffic. It was interesting to note that practically all this emergency work had been performed on telephony except for the handling of some of the telegrams.

VL2JA, main station of the P.M.G.'s Flood Emergency Net, was active right throughout the emergency. Operating with 200 watts on 5390 Kc., they were worked duplex by VK2XO on 7 Mc. The P.M.G.'s flood network extends to the Queensland border and converted 109 sets operate from the following locations: Murwillumbah, Tyalgum, Lismore, Nimbin, Kyogle, Bangalow, Woodburn and Comanahurst. All stations operate on 5 Mc.

All credit must go to Chas Peddell VK2KN for his sterling effort in operating under great difficulty. Chas set up his emergency equipment at the Police Station at Kempsey, using vibrator power supplies. He kept the town in contact with the outside world for 36 hours when no other form of communication was available.

It was a clear demonstration of the value of Amateur Radio as a National asset in times of emergency. Amateurs gave full co-operation to official stations. VL2JA, VK2AA, VZSY and VKGS at all times; the latter had the responsibility of routing the traffic handled.

The emergency net, during the weekend, developed into a State wide hook up and the following stations assisted either by relaying messages or acting as guard stations: VKs 2KN, 2AKA, 2WH, 2XO, 2ARY, 2OE, 2CU, 2UC, 2SH, 2LH, 2XP, 2ADV, 2LN, 2GC, 2A1M, 2ASM, 2CI, 2PC, 2DZ, 2DX, 2CZ, 2TG, 2AHZ, 2AQK, 2ADX, 2GI, 2VR, 2TE, 2SR, 2CW, 2DO, 2AX, 2NY, 2S, 2DS, 2AMM. Apologies to any Amateurs missed in the above list.

Here in Australia the elements are generally fairly kind to us, but in these rare times of emergency the VK Ham has shown his ability to perform one of his necessary functions, that of providing communication when other methods fail.

# THE OLD MAN

The Remembrance Day Contest is over, and what a grand contest it was, what a pleasure to work those fine operators. Seriously, I'm supposed to comment on bad signals, but one felt very proud of the operating skill of those boys on c.w. They certainly rattled those numbers through and the short "Good day Bill," "Good luck old son," gave one that warm feeling of friendship and rivalry; let's have more of these type of contests. It was noted that although participants were asked not to select three consecutive numbers, there is always the fellow who wants to be different. Didn't you get your "Amateur Radio" in time 6DX to read the rules?

There are times that I want to listen to an Interstate broadcast on 7196 Kc. and inevitably I find a few who admit they are not aware of the time and wonder if they might be causing interference. Why, oh why, must you pick 7196 Kc. on a Sunday morning when the Interstate Institute Broadcasts are

on? Noticed on this frequency one Sunday morning recently were VKs 2AHM, 3FC and 3GZ and did they mess up the broadcast from an adjoining State.

Why is it that you fellows take exception to using the phonetic alphabet? It proved itself during the War and is laid down in the Regs., for our use by the Department, but still we hear "this is VK2LK Two Leaping Kangaroos," or "this is VK6 Mexico Kilowatt." How much easier it is for the Station overseas to decipher Two Love King than to listen to Two Leaping Kangaroos.

VK2JP has again been in evidence, with his persistent jamming of local stations, trying to work that elusive bit of DX. Just how you get away with your obvious flouting of the Regulations in passing "Messages," and I mean third party messages, makes one wonder what the Experimental Advisory Committee is doing in your State. Either they deliberately do not hear you or put it down to your dotage.

The splatterers are still going strong; VK4DO, VK3UO, VK2BX and VK2JP are having a neck and neck race to become the worst offender. The same thing applies here as in the former paragraph, either the E.A.C. in the States concerned are not doing their jobs or are turning a deaf ear to this worst type of offence.

The worst signal in the Contest emanated from South Australia and VK5VO was heard on with a c.w. signal that would have been outlawed way back in 1929. Why not try a Clapp OM, it's a very simple circuit and even you should have no trouble in getting it going.

The phone in the c.w. band on 7 Mc. is still cropping up, in spite of the "Gentlemen's Agreement." Are you, or are you not, a gentleman VK3HV? You were heard there recently trying to blast your way through dozens of c.w. signals.

The key click merchants are again in evidence, just a small choke and a condenser and resistor fellows. VK4RA and VK3AAW should have heard of this method of reducing clicks, but one wonders.

Numbers of stations have been heard butting into QSOs already in progress and flipping their carriers on and off without any mention of a call sign. This is particularly noticeable in the various hook-ups of country Hams on Sunday mornings. The Regulations state very definitely that the call sign of the station transmitting and the call sign of the station being worked, must be announced on each over.

With all this criticism I feel that a word of praise may not go amiss, and I hand top place to those VK6 Hams who participated in the R.D. Contest. Without exception their signals were outstanding, their operating procedure excellent, and if they win the Contest it will be well deserved. Cheers until next month.



## WIRELESS LICENCES MUST BE RENEWED

### TUNE IN WITH AN EASY CONSCIENCE

Every person must hold a yearly broadcast listeners' licence for each receiver in his or her possession, whether in the home, place of business, holiday residence, motor car, or elsewhere, including portable sets.

The Australian Broadcasting Act provides that unlicensed radio sets are liable to seizure and the owners to heavy penalties.

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## QUESTIONS AND ANSWERS

In August issue of "Amateur Radio" VK4AG asked for information on the FL-5-E Radio Filter. We are indebted to W0SGK for his reply in this matter.

"While I may be in error, not having one of the Filters in question on hand, I'm of the opinion that this is one of the aircraft 'Range' filters used in planes for monitoring low-frequency radio range beams. In the U.S. we have a network of ranges in the 200-400 Kc. region. One carrier is sent out from four vertical towers, another carrier sent out from the centre tower, just 1020 cycles off the outer tower carrier frequency.

"The outer towers are modulated with c.w. signals, 'A' and 'N,' transmitted from opposite towers. The centre carrier is voice modulated with weather reports, transmissions to planes not otherwise equipped with radio gear, and the like. These filters are therefore so arranged that they may be switched to reject all but 1020 c.p.s., in 'range' position. To reject 1020 c.p.s. and pass all others, in 'voice' position, or may be switched out of the circuit entirely in 'normal' position. Thus, a pilot may 'fly the beam' or receive weather reports, landing instructions, whatever he prefers, while another pilot may be desiring the exact opposite without any interference between the two.

"Signal Corps equipment was standardised with two impedances—headphones were 8,000 ohms and 600 ohms. Output transformers in receivers were 4,000 ohms, to handle two phones in parallel, and in most cases were tapped at 600 ohms. The FL-8 series were the high impedance filters and the FL-5 series were the 600 ohm type, both in and out. These were made by different manufacturers, and in some cases had minor modifications to specifications. The last letter indicated either manufacturer or modified type, but to my knowledge never indicated a radical departure from operating specifications.

"All things considered, it appears that he has a nice gadget to use in cleaning out QRM on c.w.—600 ohms in, 600 ohms out. Some lads over here complain that the 1020 cycles tone is too high pitched and have done some tinkering with these filters to try to change the pass frequency. I haven't heard of their being too successful. I've never torn into one; have a FL-8-B, myself."

## AMATEUR STATION INSPECTIONS

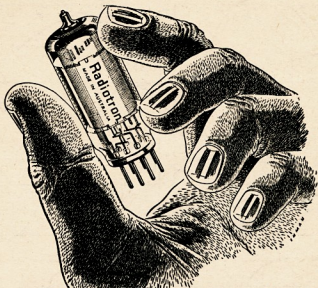
Inspections of ALL Amateur Stations are to be carried out within the next few months.

Under P.M.G. Regs. 61 and 62, it is necessary to have available the station licence and the operator's A.O.C.P.

Log Books and records of tests and experiments are also to be available for inspection. Wave meters and/or frequency meters to be viewed.

Where possible, Amateurs are requested to arrange for access to their stations during the day by leaving a key or authority to enter with a responsible person.

No equipment will be turned on except in the presence of the licensee.



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A.C. miniatures for 6.3 volt supply.

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# Radiotron



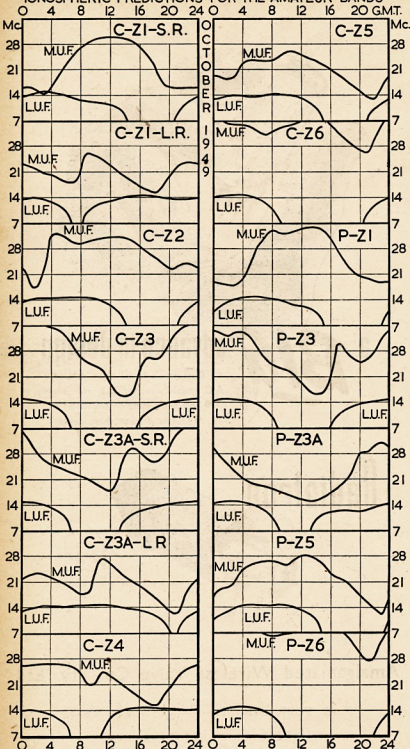
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# IONOSPHERIC PREDICTIONS FOR THE AMATEUR BANDS



## DISPOSALS

The following is a copy of a series of questions asked in the Federal Parliament. The answers supplied by the Minister responsible are very interesting. These questions and answers were published in Hansard.

### QUESTION—

To ask the Minister representing the Minister for Supply and Development:

(1) Has the Disposals Commission been in the habit of selling wireless parts by private negotiation to the Wireless Institute at prices lower than obtainable at public auction.

(2) If so, what is the total quantity of such sales made during the past three years.

(3) If the quantities sold are sufficient to enable the Institute to enter into competition with other traders who buy at auction, does the Government intend to continue such sales?

(4) As the goods are, or were, Commonwealth property, what was the reason for the departure from the usual sales procedure.

### ANSWER—

(1) The Commonwealth Disposals Commission sells wireless parts direct to the Wireless Institute but only at prices which are at least equal to those obtained for similar items at auction.

(2) During the past three years, sales to the Wireless Institute throughout the Commonwealth have been in the vicinity of £11,800.

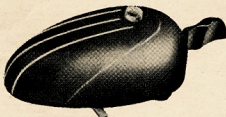
(3) The Wireless Institute is not a trading organisation and with each order gives an undertaking that the items are for personal experimental use of its members and not for re-sale by members. The Commission has been advised that each member of the Institute has signed a special undertaking not to re-sell equipment purchased for them by the Institute. The Commission proposes to continue selling to the Wireless Institute.

(4) The approved sales procedure of the Disposals Commission provides that after the requirements of Government authorities have been met, special consideration will be given to the needs of bodies engaged in educational, charitable, health, and general community activities. The Wireless Institute is regarded as an educational body as it exists for the encouragement and scientific development of radio communication. Amateur radio enthusiasts operate under a licence from the P.M.G.'s Dept. which prohibits the use of their equipment for pecuniary gain. Members give valuable community service in times of emergency and rendered outstanding service to the Commonwealth during the war. In addition to supplying trained operators for Navy, Army and Air Force Signal Corps, they assisted the operations of Air Observation Posts by reporting the movements of aircraft. It is in the interests of the Commonwealth to encourage members of the Institute by enabling them to obtain their requirements without the necessity of purchasing at enhanced rates through radio dealers.





# NEW ADDITIONS TO THE FAMOUS EDDYSTONE RANGE



## SEMI-AUTOMATIC MORSE KEY

As the illustration shows, this key is of really modern design, being totally enclosed in a streamlined diecast housing, which is finished a fine ripple black with chrome relief. The movement has received special attention and is a fine example of first class light engineering. Words cannot do justice to the beautiful action, you must try the key for yourself to appreciate it. It is fully adjustable to enable any operator to make full use of the wide range of speeds provided. The handle has been designed to give equal facility to right or left handed operators. A short circuiting switch is fitted to the base, which is a heavy diecasting provided with rubber feet and with holes for screwing down.

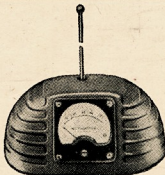
Cat. No. 689, £8/6/3 (plus tax).



## SIGNAL STRENGTH METER

This "S" Meter has been designed primarily for use with the "640" Receiver. It is contained in a neat diecast housing, finished a fine ripple black to match the Receiver. The necessary resistors, including the zero adjuster, are fitted inside. The meter, which has a 200 microampere full scale deflection, is calibrated in "S" units and decibels above S9, on the basis of a 4 db increase in carrier strength for each "S" point. The leads terminate in an octal plug, or permit direct connection to the socket on the rear of the "640" Receiver.

Cat. No. 669, £9/3/9 (plus tax).



## MODULATION LEVEL INDICATOR

This instrument is contained in a neat diecast box, finished a fine ripple black. The circuit employs two Germanium Crystal Rectifiers. The small pick-up aerial provided, plugs into a socket on top and a socket at the rear takes a coil for the particular frequency band in use. No external connections are necessary. In use, the R.F. pick-up is adjusted until the meter reading coincides with a special mark on the scale. On switching over, modulation percentages can be read off instantly against the directly calibrated scale. In addition, the instrument may be used as a phone monitor, a telephone jack being provided at the rear for this purpose. The meter itself is a very sensitive one (200 microamp. full scale deflection) which permits the instrument to be used as a field strength meter. In the latter service, it will assist materially in such experiments as lining up a beam aerial, determining radiation patterns, effect of variation of coupling and matching systems, etc. The calibration holds good over the whole range of Amateur Bands, up to 28 Mc.

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- WEST. AUSTRALIA: CARLYLE & CO. LTD., Hay St., Perth, & 397 Hannan St., Kalgoorlie.
- WESTERN AUSTRALIA: ATKINS (W.A.) LTD., 894 Hay Street, Perth.
- QUEENSLAND: CHANDLERS PTY. LTD., Corner Albert and Charlotte Sts., Brisbane.
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- TASMANIA: W. & G. GENDERS PTY. LTD., 53 Cameron St., Launceston, and Liverpool Street, Hobart.

# 1948 VK-ZL DX CONTEST RESULTS

The following are the results of the 1948 VK-ZL DX Contest as received from the N.Z.A.R.T. These are as yet incomplete and the full list of entrants, with scores, will be published as soon as received.

Approximately 300 logs were received in all. The prizes will be despatched to the winners very shortly, and two plaques, and certificates, will be sent by the N.Z.A.R.T.

## VK TRANSMITTING—C.W.

### Open—

VK3EG	.....	113,318 Pts.
<b>Highest District Scores—</b>		
VK2DG	.....	91,834 Pts.
VK3EG	.....	113,318 "
VK4XJ	.....	4,491 "
VK5FM	.....	25,984 "
VK6RU	.....	35,430 "
VK7RI	.....	15,267 "

### Highest Individual Band Scores—

VK2RA	.....	1,482 Pts.	40 Metres
VK2DG	.....	91,834 "	"
VK2RA	.....	384 "	"
VK2YL	.....	15,840 "	"
VK3EG	.....	1,564 Pts.	40 Metres
VK3EG	.....	111,114 "	"
VK3XK	.....	480 "	"
VK3HT	.....	7,168 "	"
VK4XJ	.....	27 Pts.	40 Metres
VK4XJ	.....	3,420 "	"
VK4XJ	.....	1,044 "	"
VK5JE	.....	880 Pts.	40 Metres
VK5FH	.....	33,615 "	"
VK5FM	.....	3,040 "	"
VK6RU	.....	27,864 Pts.	20 Metres
VK7RK	.....	189 Pts.	40 Metres
VK7KB	.....	28,028 "	"
VK7JT	.....	2,166 "	"

## TRANSMITTING—PHONE

### Open—

VK2AHA	.....	39,525 Pts.
<b>Highest District Scores—</b>		
VK2AHA	.....	39,525 Pts.
VK3LN	.....	33,016 "
VK4KS	.....	24,864 "
VK5	.....	No. Entry
VK6KW	.....	16,735 Pts.
VK7AZ	.....	33,570 "

### Highest Individual Band Scores—

VK2AHA	.....	34,800 Pts.	20 Metres
VK2ADT	.....	12,600 "	"
VK3LN	.....	32,916 Pts.	20 Metres
VK3QK	.....	3,336 "	"
VK4KS	.....	24,864 Pts.	20 Metres
VK6KW	.....	10,465 Pts.	20 Metres
VK6HL	.....	9,440 "	"
VK7AZ	.....	31,400 Pts.	20 Metres
VK7AZ	.....	2,170 "	"

## RECEIVING—

E. Trebilcock, Wynyard, Tasmania, B.E.		
R.S. 55,958 Pts., Phone, C.W.		
A. J. Gibbs, Mt. Hawthorne, Western Australia, 18,912 Pts., Phone.		
A. E. Moore, Brisbane, Queensland, 12,510 Pts., Phone.		

## PRIZES FOR 1949 VK-ZL DX CONTEST

As the lists of prizes for the 1949 VK-ZL Contest is not yet complete, it is regretted that they cannot be announced in October's issue of the magazine. Listen to the W.I.A. broadcasts for news of the prizes.

# W.A.S. (AUST.) RULES

1. This Award has been created in order to stimulate interest in v.h.f. bands and is of a high standard to fully acclaim the proficiency of the recipients on their v.h.f. achievements. The award is to be known as the W.A.S. (Aust.) Certificate and is to be issued to any Amateur in Australia or overseas who satisfies the following conditions.

2. The Certificate will be awarded for contacts on the 50 Mc. band and higher frequency bands. All contacts must be made on the same band, and cross-band contacts will not be allowed.

3. Portable operation will be permitted provided that such portable location shall be within the same State and not more than 25 miles from the fixed location in the case of Australian stations, and in the same call area and not more than 100 miles from the fixed location in the case of overseas stations.

4. The applicant is required to submit verifications from the following areas of the Commonwealth of Australia:—

- (a) New South Wales, Australian Capital Territory, or Lord Howe Island.
- (b) Victoria.
- (c) Queensland.
- (d) South Australia.
- (e) Western Australia.
- (f) Tasmania.
- (g) Northern Territory.

In all, seven (7) verifications are required.

5. Additional credit will be given for verifications from other overseas countries, say, New Zealand or the Territory of Papua and New Guinea, in the form of a sticker to be attached to the Certificate.

6. It will be necessary for the applicant to produce documentary proof in the form of QSL cards or other written evidence which completely verifies

a two-way contact has been made. By completely stating the time and date, signal strength, type of emission used, location of the claimed station and the frequency used must all be clearly shown on the verification.

7. Contacts may be made using any authorised type of emission and must be in accordance with the current P.M.G.'s Regulations or those applying in the country of the applicant.

8. Submitted verifications must be exactly as received and not altered or marked. Failure to comply with this rule will lead to the disallowance of that card and may lead to the disqualification of the applicant.

9. All applications must be accompanied by a list setting out the details required by Rule 6, and stating whether any of such contacts were made while portable, and if so, giving that location. Sufficient postage must be enclosed for the return of verifications to the applicant, registration being included if desired.

10. The verifications and list (Rule 9) will be addressed to the "Awards Committee, Box 2611W, G.P.O., Melbourne, Australia."

11. The verifications so submitted will be examined by the Awards Committee, who will arrange for the successful applicants' names and call signs to be listed monthly in "Amateur Radio." Certificates will be forwarded to successful applicants through Divisional Councils or direct to overseas applicants as the case may be.

12. The decisions of the Awards Committee of the W.I.A. in the interpretation and application of these rules shall be final.

13. Notwithstanding anything to the contrary, the Federal Council of the W.I.A. reserve the right to alter these Rules from time to time as necessary.

# "CQ'S" WORLD-WIDE DX CONTEST

For the 1949 Contest, separate 48-hour periods for phone and c.w.—awards for individual and group-operated stations—no limit on contacts per country and a new feature, awarding prizes for the highest 1-band scores as well as multiple-band scores.

1. Contest Period.—PHONE SECTIONS: 0200 G.M.T. October 29 to 0200 G.M.T. October 31.

C.W. SECTIONS: 0200 G.M.T. November 5 to 0200 G.M.T. November 7.

2. Bands.—The Contest activity will be confined to three Amateur Bands: 7, 14, and 27/28 Mc.

3. Competition will be divided into four sections as follows:—

- (1) One-operator phone section.
- (2) Multiple-operator phone section.
- (3) One-operator c.w. section.
- (4) Multiple-operator c.w. section.

Stations in both phone sections may contact each other, and stations in both c.w. sections may contact each other, but no contacts between phone and c.w. stations will be allowed.

4. Equipment.—There will be no limit to the number of transmitters and receivers allowed, and competitors may use the maximum transmitter power permitted under the terms of their licenses.

5. Serial Numbers.—C.W. stations will exchange serial numbers consisting of five numerals, the first three being the RST report, and the last two being their own zone number. Stations in Zones 1 through 9 will prefix their zone number with zeros (01, 02, 03, etc.). Phone stations will exchange serial numbers consisting of four numerals. The first two being the readability and strength report, and the last two being their own zone number. Phone stations in Zones 1 through 9 will prefix their zone number with a zero (01, 02, 03, etc.).

6. Contacts.—Contacts between Amateur Stations on different continents shall count those points; contacts between Amateur Stations on the same continent, but not in the same country, shall count one point; contacts between stations in the same country, for the purpose of obtaining zone and/or country multipliers, shall be permitted, but no points will be allowed for these contacts.

7. Multipliers.—Two types of multipliers will be used: (1) a multiplier of 1 for each zone contacted on each band, (2) a multiplier of 1 for each country worked on each band.

8. Awards.—1st, 2nd and 3rd place certificates will be awarded for each of the four Sections as follows:—

A. To the highest scoring stations on each SINGLE BAND in the following areas:—

- (a) Each call area of the U.S.A.
- (b) Each licensing area of Canada and Australia.
- (c) All other countries.

B. To the stations having the highest combined total on ALL BANDS (or more than one band) in the following areas:—

- (a) Each call area of the U.S.A.
- (b) Each licensing area of Canada and Australia.
- (c) All other countries.

Certificates will also be awarded to each operator of each winning station in the multiple-operator sections.

9. Scoring.—The Contest score will be the sum of all contact points multiplied by the sum of the zone and country multipliers.

A. Everyone who sends in a log for a single band is eligible for a single band award only.

B. Those who submit logs for two or more bands will be eligible for the all band award, as well as the single band award.

10. Zones and Continents.—The W.A.Z. boundaries as defined in "CQ" and the "CQ DX Handbook," as well as the W.A.Z. maps, will be recognised, and for continental boundaries, the same as used for W.A.C. will be recognised. Should any question arise as to the positive location of any station, the official definition will be used. Copies of the country list and contest logs are available from the "CQ" editorial offices upon receipt of a stamped, self-addressed envelope, or in the case of overseas stations, unattached postage stamps.

## OPERATING SUGGESTIONS

We suggest that overseas phone operators indicate which end of the band they are tuning, or which portions of the phone band (American or foreign) they intend to tune. On 25 Mc., where the band is 1700 Kc. wide, it is extremely important that overseas phone stations specify the approximate frequency they intend to tune. C.W. stations, likewise, could greatly save by indicating where they intend to tune. We think if the above principle is used by all, it will result in far less QRM, as well as fewer useless calls.

Foreign Amateurs, remember, scores are based on the greatest number of different countries and zones as well as stations worked. Do not concentrate on working only U.S. stations. This is a world-wide competition!

# FIFTY MEGACYCLES AND ABOVE

Compiled by J. K. RIDGWAY, VK3CR.

## NEW SOUTH WALES

The contest on 4 metres drew fifty-five stations out all told. As always, contests create considerable interest. No DX broke through, but Canberra was the only station to be heard in Sydney. The 2TA also worked. Newcastle district was particularly co-operative. Stations such as 2KZ, 2BQ, 2VU, 2SU, 2UP being phone QSOs in Sydney. The regulars like Dave and Jack 2BZ and 2AJP reaching nine plus at times. 2VU of Singleton is active again. 208 also fixing antenna and been heard in Sydney.

In spite of power restrictions, postponed meetings, etc., the contest got under way, due largely to the efforts of our V.H.F. President, Vaughan Wilson 2VU. Some of the reasons for regarding the contest rules and were to be discussed at the following meeting. This meeting, owing to the coal strike, could not eventuate. Rather than postpone the contest, which was being eagerly awaited, a previous contest rulings were adopted and used. General opinion being favourable except in the matter of duration. Such opinion is unanimous in having shorter contests. Discussion at a future meeting will take place.

2ABQ, who has a very fine station, held a "Ham Fest" on the 17th August. Present were 2BP, 2ADT, 2BZ, 2RU, 2KR, 2BQ, 2AH, 2KR will be on 2 metres over and six too, we hope. All keen with the contest. The contest leader, combined efforts of eight Hama was required and reduced the L/C ratio of a nine watt transmitter tank, "C" removed and "ell" left.

Amateurs were from both due to stray rectification can have complete relief by using f.m. The writer was forced to rapid action during the contest and used his neck of with undignified and score. Co-operation proved that stray rectification was responsible. No trace of h.c. could be noticed upon f.m. was used on maximum deviation. All reports indicate more audio on f.m. than a.m. although an oscilloscope showed full modulation on a.m. Results vary slightly, being dependent upon the receiver and available power. The writer is of the opinion that f.m. is a more reliable mode of transmission. If this slope is very gradual (alignment also important) the report will say audio down and vice versa. When very steep, the f.m. as listened to on an s.m. receiver is poorer than a.m. Narrow band adaptors are needed and will become general in time. F.M. results in a tremendous saving of gear. Sydney has much, and is particularly interested and stations using f.m. now are 2VP and 2AH. Stations contemplating are: 2WJ, 2AWJ, 2MQ, 2ARF, 2BZ, and 208 of Canberra.

The arrangement giving good results used by 2ABQ is as follows: 6AG7 e.c. Clapp oscillator with 100 ohm 5.534 ohm 68A7 resistance modulator connected to cathode. The circuit is identical to that described in Sept. "A.R.". The fifth harmonic is used and the next 6AG7 tripler to 50 Mc. The modulator is driven by a 6AG7 tripler with 40-50 watts input. It is a three stage rig multiplying the fundamental 15 times and is simplicity itself. The pre-amplifier is used to feed the 68A7. This rig also provides an excellent driver f.m. rig for 2 metres. The Clapp is tuned to 3.2 Mc. The 815 now receives 48 Mc. and is loosely coupled to an 813 tripler to 144 Mc. which in this case drives an 829B to 100 watts on 2 metres. As a result of this, further frequency multiplication (45 x 1012), the device is sufficient to add substantially on 2 metres. Don't lose sight of the Class C telegraph conditions for your tubes when f.m. is used. Reports indicate better quality on f.m. than a.m.

Realising how difficult it is to make full use of the high g.m. modern v.f.s. valves, several of the range have been used in circuit to add substantially high input loading. We may well ask ourselves what g.m. we realise in circuit with the v.f. stages of receivers! Regeneration and noise are synonymous.

A visit recently to 2GU provided the answer to the reason for consistently being heard in Sydney. Arch has efficiency all-round. The final is disc type condenser tuned. The receiver uses B1C (VB126) and EF80 mixer. Is a triple conversion job finishing up at 60 Kc. While in use, in daytime a Sydney station was very well heard. The station has one favourable feature in as much as the ground falls away in front and towards Sydney. However, 2TA, of Young, is worked over immediately rising ground.

## VICTORIA

Surprise of the month was the break-through on the 14th of August, during the Remembrance Day Contest. Although the contest was not substantially to their scores. DX stations worked were 4HD, 4RT, 4FN, 4XN, 4CU, 2LH and 2ADP. The 2TA on 2 metres, 2KR, 2SM, 2ACB, and 2BQ. Peak signal strength was very high, however fading was rather severe. A selective effect was noticed with the skip alternating between VK3 and VK4. It is interesting to note that the band has opened in June, July and August, at exactly 27 days intervals.

With the improved weather in Victoria, conditions as far as country stations are concerned have been noticeably better, with 2AFP and 2UJ putting through much steeper and more reliable signals than they have during the past few months. It is hoped that a Melbourne to Sydney six metre relay will be possible before long. The only gap now to be covered is the one between 30U or 2AFP and 2BW, a distance of about 150 miles.

In Melbourne the V.H.F. Marathon has coaxed a few more into the band, however there is plenty of room for more. A new station to appear during the month was 2AUX of South Yarra who is putting out a good signal from a single 807 and dipole antenna. 2BD has at last got a 30U or 2AFP, he is not hampered by lack of space or (we hope) h.c. troubles. Eric is now at Gardenvale and hopes to have a 4 element beam or a very strong signal from a temporary dipole, so should be one of the best signals on the band when the beam is up.

## 144 Mc. ACTIVITY

New South Wales.—Two metres has been rather quiet. Much preparation though is taking place. Activity amounts to cross-band working mostly. 2BZ has 65 watts on a 829B to 3 over 3 and can cross-band Sydney almost any time. 2ADT has a 829B also nearly installed on 2 and will be another in Sydney soon. Looks as though we need a cross-band contest! 2LY has 829 and is fixing 2 metre gear. Stations heard with very good signals recently on this band are: 2XG (xal), 2BQ (xal), 2AWX (xal), 2ABZ (xal), 2DQ (xal), and others. 2AAJ puts 5 meter off scale on horizontal beam.

Victoria.—Activity on this band continues at a high level with new stations 2OP and 2BZ making an appearance, while several others are getting receivers and transmitters going and should be on before this appears. 2AKE of Geelong has been carrying out some interesting antenna tests. Ed now has three antennas available. One is a 16 element beam at an average height of 25 feet, a 3 element beam 40 feet high co-ax fed, and a 3 over 3 45 feet high fed with 200 ohm line. The last 3 antenna appears to give the most reliable signal on both transmission and reception, allowing several Melbourne stations who were difficult to work previously to be contacted with ease.

In Melbourne 3UJ has reappeared on the band after a couple of months absence. Andy is busy rebuilding a 4 element 16 element beam. The 4 element, the new beam will be much higher than the old one.

Over the weekend of the 3rd and 4th of September, 3IM paid a visit to 3VL and 3US at Red Hill taking with him his 144 Mc. converter. Using a 3 element beam 44 feet high as antenna, 3ARA and 3XW were worked cross-band to 10 Mc. with extremely strong signals over this 42 mile path. Several other stations on 144 Mc. were also heard at ground level. Due to being very busy building a new house, 3UX and 3GW will not be on 144 themselves for several months.

## 228 AND 576 Mc. ITEMS

Victoria.—At last a move to populate this band is under way in VK3. 2AFN and 2AWE have already been testing out gear; 2XW hopes to be on with an 802B and an 8 or 16 element beam. 3UJ and several others are planning gear. This band should prove very useful for the simpler type of gear now that 144 Mc. is easily crystal controlled in VK3. Polarisation is to be made decided to use vertical polarisation.

At last the 576 Mc. gap has been finished the other stations connected with the Exhibition, they are holding them back from the band and are preparing to start afresh. 3XW is obtaining a pair of 8012s from England and expects to be bringing 80 watts before long. This will be quite a change from the low power previously used and should make a great difference to signals. 3GU has also obtained an 8012; however there is some doubt as to whether it is a good one or not.

## "TWO AND SIX" JOTTINGS FROM N.S.W.

2AC has beam and f.m. receiver on 6, but much time these days. 2BG hears things when power lack stops and works 2GU. Delighted with cross-band two and six. Dave starts lots of things and used 2 metres nearly two years ago. Also f.m. 2DF has tremendous signal when using outdoor antenna. Has discussion going on 6 and says f.m. stations sound excellent. 2EQ has a 30U and hopes for more QSOs. 2NO would like to build more, but very busy now. 2RU soon transmitting on 2. 2UD pushes band-pass apri. and v.f. stages. 2VJ rebuilding f.m. v.d. and receivers. 2YL nice e.w. and phone in Sydney Harry. 2VU f.m. plus and very nice to listen to. 2WJ has a 30U and monitors and fundamentals just now. 2VW has P104 receiver.

2ABQ has few contacts now and again. 2ADT on two metres soon. Jack has 2KF (Kurri-Kurri) on 2 and 6 to talk to now. 2ADW has a new modulator and halo. Sounds good Dick. 2AEZ Ernie from Gosford comes big now, beam helps. 2ABJ a beam soon, and then Jim will make fine sig. 2AMU 3 over 3 on six soon. How about more power Ernie. 2WZ will only now. 2ARZ needs six metre transmitter on the way. Beams 3 over 3 on six and 10. Also 10 metre beam on same pole. 2AWZ 815 and beam on 6, and going well now Dave.

Gladstone Radio Club will be holding a Field Day on Sunday, 18th October. Two metre Direction Finding competition. This type of "Contest Come Field Day" has proved very popular. More details next month.

The 6 metre contest is finished and the unofficial places are 2AH, 2ADT and 2WJ.

The above notes were received from VK2AH and VK3IM.

## Low Drift Crystals

FOR AMATEUR BANDS

ACCURACY 0.02% OF  
STATED FREQUENCY

3.5 Mc. and 7 Mc.

Unmounted ..... £2 0 0

Mounted ..... £2 10 0

12.5 and 14 Mc. Fundamental  
Crystals, "Low Drift,"  
Mounted only, £5.

Spot Frequency Crystals  
Prices on Application.

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THESE PRICES DO NOT  
INCLUDE SALES TAX.

## MAXWELL HOWDEN

15 CLAREMONT CRES.,  
CANTERBURY, E7,  
VICTORIA



# FEDERAL, OSL, and DIVISIONAL NOTES

Federal President: W. R. Gronow, VK3WG; Federal Secretary: W. T. S. Mitchell, VK3UM, Box 2611W, G.P.O., Melbourne.

## NEW SOUTH WALES

Secretary—Dick Dowe (VK2RP), Box 1734, G.P.O., Sydney.  
 Meeting Night—Fourth Friday of each month at Science House, Corner Gloucester and Essex Sts., Sydney.  
 Divisional Sub-Editor—L. D. Cuffe, VK2AM, 14b Watson Street, Neutral Bay, N.S.W.  
 Zone Correspondents—North Coast and Tablelands: P. A. H. Alexander, VK2PA, Hill St., Port Macquarie; Newcastle: E. J. Baker, VK2JP, 15 Skilton St., Hamilton, Newcastle; Coalfield and Lakes: H. Hawkins, VK2VJ, 27 Comfert Ave., Cessnock; Western: G. J. Russell, VK2QA, 116 Bogan St., Nyrang; South Coast and Tablelands: H. H. Rayner, VK2DO, 42 Pettit St., Yass; Southern: E. N. Arnold, VK2GA, 678 Forrest Hill Ave., Albany; Western Suburbs: A. C. Pearce, VK2ARB, 46 Harzbrook Ave., Five Oaks; Eastern Suburbs: H. Kerr, VK2AX, No. 4 Flat, 144 Hewlett St., Brenton; North Sydney: L. D. Cuffe, VK2AM, 719 Military Rd., Mosman; St. George: J. A. Ackerman, VK2ALD, 35 Park Rd., Carlton; South Sydney: V. H. Wilson, VK2VW, Cr. Wilson St. and Marine Pde., Maroubra.

## VICTORIA

Secretary—C. O. Qin, VK3WQ.  
 Administrative Secretary—Mrs. O. Cross, Law Court Chambers, 51 Collins St., Melbourne.  
 Meeting Night—First Wednesday of each month at the Radio School, Melbourne Technical College.  
 Zone Correspondents—North Western: R. E. Trebilcock, VK3TL, 122 Victoria St., Korang; Western: C. C. Waring, VK3YW, 12 Skene St., Siwell; South Western: W. H. Ross, VK3UT, Ballangrich, via Warrnambool; North Eastern: J. A. Miller, VK3ADG, "Erivale" Ave.; Far North-Western Zone: Harry Dobbyn, VK3MF, 42 Walnut Ave., Mildura; Eastern Zone: Mrs. P. M. Churchward, VK3US, "Shirley," Red Hill.

## WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

VK2WI—Sundays, 1100 hours EST, 7195 Kc. and 2000 hours EST, 50.4 Mc. No frequency checks available from VK2WI.  
 Intra-State working frequency, 7175 Kc.

VK3WI—Sundays, 1130 hours EST, simultaneously on 3580 Kc. and 1990 Kc. and re-broadcast on 50 and 144 Mc. bands. Intra-State working frequency 7185 Kc. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

VK4WI—Sundays, 0900 hours E.S.T. simultaneously on 3750 Kc., 7196 Kc., 14342 Kc., 52.4 Mc. and 144.138 Mc. Frequency checks are given two nights weekly, and the times are announced during Sunday broadcasts. 7065 Kc. channel is used from 1000 to 1030 hours each Sunday as VK4 query service to VK4WI.

VK5WI—Sundays, 1000 hours SAST, on 7186 Kc. Frequency checks are given by VK5DW on Friday evenings on the 7 and 14 Mc. bands.

VK6WI—Saturdays 1400 hours, Sundays 0930 hours WAST, on 7196 Kc. No frequency checks available.

VK7WI—Second and Fourth Sundays at 1000 hours E.S.T. on 7196 Kc. No frequency checks are available.

## QUEENSLAND

Secretary—W. L. Stevens, VK4TB, Box 6382, G.P.O., Brisbane.  
 Meeting Night—Last Friday in each month at the Y.M.C.A. Rooms, Edward Street, Brisbane.  
 Divisional Sub-Editor—F. H. Shannon, VK4SN, Minden, via Rosewood.

## SOUTH AUSTRALIA

Secretary—E. A. Barber, VK5MD, Box 1234K, G.P.O., Adelaide.  
 Meeting Night—Second Tuesday of each month at 17 Waymouth St., Adelaide.  
 Divisional Sub-Editor—W. W. Parsons, VK5PS, 483 Explanade, Henley Beach.

## WESTERN AUSTRALIA

Secretary—W. E. Coxon, VK6AG, 7 Howard St., Perth.  
 Meeting Place—Padbury House, Cur. St. George's Street and King St., Perth.  
 Meeting Night—Watch the Monthly Bulletin.  
 Divisional Sub-Editor—George W. Ashley, VK6GA, 33 Mars Street, Carlisle, Western Australia.

## TASMANIA

Secretary—R. D. O'May, VK7OM, Box 371B, G.P.O., Hobart.  
 Meeting Night—First Wednesday of each month at the Photographic Society's Rooms, 165 Liverpool St., Hobart.  
 Divisional Sub-Editor—Capt. E. J. Cruise, VK7EJ, Anglesea Barracks, Hobart.  
 Northern Correspondent: C. P. Wright, VK7LZ, 3 Knight St., Launceston.

## FEDERAL

### DX C.C. LISTING

As new applicants seem to be in some doubt of the actual Rules for application to DX C.C. membership, we hope to publish next month the Rules once again for general information. The Rules were last published in "A.R." for August, 1947, and amended in Federal Notes for April, 1948.

### PHONE

VK2JD (1)	24	96	122
VK2KW (1)	24	96	122
VK2RU (2)	24	96	122
VK2BZ (3)	24	96	122
VK2DQ (4)	24	96	122
VK2JE (7)	24	96	122
VK2IG (5)	24	96	122

### C.W.

VK3BZ (6)	24	96	122
VK3CN (1)	24	96	122
VK3VW (4)	24	96	122
VK3SU (5)	24	96	122
VK4EJ (9)	24	96	122
VK3EK (8)	24	96	122
VK3KH (10)	24	96	122
VK4HR (8)	24	96	122
VK3EO (2)	24	96	122
VK4DA (7)	24	96	122
VK4RB (9)	24	96	122
VK3UM (12)	24	96	122

### New C.W. Members—

VK4RO (13)	24	96	122
VK3APA (14)	24	96	122

### OPEN

VK3BZ (4)	24	96	122
VK2JD (2)	24	96	122
VK2RU (8)	24	96	122
VK2JE (12)	24	96	122
VK4HR (7)	24	96	122
VK3EK (5)	24	96	122
VK3WV (13)	24	96	122
VK3MO (5)	24	96	122
VK3ED (10)	24	96	122
VK3OP (19)	24	96	122
VK2NS (16)	24	96	122

### New Open Member—

VK4UL (8)	24	96	122
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## COUNTRIES LIST

We have received preliminary information (not confirmed as yet) from the International Telecommunication Conference now sitting in Bern, Switzerland, that some time in the near future, Amateurs in the following countries will no longer be able to communicate with other Amateurs. At present we do not know the reasons behind this, but will keep all informed of developments. The countries concerned are: Austria, Burma, French Oceania, Greece, Indo China, Indonesia, Iran, Israel, Lebanon, Madagascar and dependent Mauritius, Netherlands, Siam, St. Pierre and Miquelon, Togoland and the Antilles (which covers all the Caribbean Island countries).

## W.I.A. ACTIVITIES CALENDAR

Oct. 1-2: 1949 VK-LX DX Contest (e.w.).  
 Oct. 8-9: 1949 VK-LX DX Contest (phone).  
 Oct. 15-16: 1949 VK-LX DX Contest (e.w.).  
 Oct. 22-23: 1949 VK-LX DX Contest (phone).  
 Nov. 26-27 Third European Contest (e.w.).  
 Dec. 3-4 Third European Contest (phone).  
 Dec. 19: Motions for 20th Federal Convention due.

## I.A.R.U. CALENDAR

The June, 1949, Calendar of the Union contains a resume of the 25 years since the formation of the Union. It was first founded in Paris on the 12th March, 1924, at which nine countries were represented. The 1950 I.A.R.U. Congress is also proposed to be held in Paris next year and all Societies have been asked to pass comment on this proposal. Interesting information on the outcome of the Fourth Inter-American Radio Conference and the proposals adopted is given, as well as notification of the Voice of America Broadcasts mentioned in last month's "A.R." The United Nations and the I.A.R.U. have reaffirmed their mutual agreement for an additional year ending 17th April, 1950.

Three proposals for membership voting, moved by the W.I.A.L., were discussed in the other part of this issue. These proposals dealt with matters brought up at the 19th Convention of the W.I.A. in April last. Some interesting figures on the number of licensed Amateurs in the various member societies, which reveal that the W.I.A. have the third highest in the world. The R.S.G.B. are second and of course the A.R.R.L. the first.

## AMATEURS LICENCED IN AUSTRALIA

As at the 1st August, 1949, the following are the number of licensed Amateurs in each of the districts of Australia:—

VIK—6, VK2—954, VK3—868, VK4—296, VK5—298, VK6—179, VK7—96, VK9—30; total 2,727.

The above figures are those to be used in determining the State winner for the Remembrance Day Trophy.

## 1949 REMEMBRANCE DAY CONTEST

The 1949 R.D. Contest is once again past and, judging by the comments of those who took part, a really bumper Contest resulted. This may well be when it is realised that over 400 Australian stations took part, and some 200 logs have been received. The checking appears to be a big job this year, and is growing to the proportions of the VK-LX DX Contest. This alone indicates the success of this event.

From a check of those taking part, it appears that the phone stations are greatly in the majority, most operating exclusive Phone. This should be truly an open event with a 50-50 proportion of both phone and c.w. The general standard of operating was excellent, and very few poor c.w. signals were heard, but a greater number of phone stations should watch that gain control. To all those who did not enter, we can only say they missed an excellent Contest—next year's should be better still.

## W-V-E 1949 CONTEST

Some preliminary results have been obtained which reveal that in the c.w. section, WBBHW ran up the colossal total of 390,450, followed closely by W2FO with 308,458, and VK4FE with 363,558. Outside of the U.S.A., once again Juan Lobos Lobo XPIA continues to pile up "Superman" scores like his 196,311 from 3,051 contacts. Then came CN2AB with 499,848 and VK4VW with 492,222. High Europe score was E4HQ with 233,508, PA0UN and HA5B with 203,556.

## COMMERCIAL STATION LOGS

By now all State observers should have received their report sheets. It is hoped if possible that each State observer will have access to a typewriter so that a legible log may be furnished to the P.M.O.'s Department. It is hoped that not only will all the logs we expect to arrive in the near future, so please endeavour if no typewriter is available, to make a neat job of the entries.



T.C.C. 1.5 uF, 4,000 v.w. Condensers, £2 each.

Chanex 2 uF, 3,000 volts d.c. working, £1/15/- each.

Ferranti 0-500 Microampere Meters, luminised dial, new, £2 each.

R.C.A. 834 Tubes, new, £1/8/- each.

VALVES—

R.C.A. 866A Rect., £1/5/- ea. Sylvania 6L6Gs, 15/- each.

1616 Rectifiers, 17/6 each. 6AC7s, 12/6 each.

R.C.A. 6U7Gs, new, sealed cartons, 9/- each.

6SH7s, S.H., 5/- each.

Crystals as illustrated, 40 or 80 mc., AT or BT cut. Accuracy 0.02% of your specific frequency, £2/12/6 each.

20 metre Zero Drift, £5 each.

Large, unmounted, 40 or 80 metre, £2 each.

Special and Commercial Crystals.

Prices on application.

#### CRYSTALS RE-GROUND.

£1 each.

#### BRIGHT STAR CRYSTALS

may be obtained from the following Interstate firms: Messrs. E. Harold, 123 Charlotte St., Brisbane; A. G. Healing Ltd., 151 Pirie St., Adelaide; Atkins (W.A.) Ltd., 894 Hay St., Perth; Lawrence & Hanson Electrical Pty. Ltd., 120 Collins St., Hobart; Collins Radio, 409 Lonsdale St., Melbourne.

A.W.A. Split Stator Transmitting Condensers, high voltage, £2/15/- each.

Screw Type Neutralising Condensers (National type) to suit all triode tubes, Polystyrene insulation, 19/6 each.

Prompt delivery on all Country and Interstate orders.

Satisfaction Guaranteed.



## BRIGHT STAR RADIO

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1839 LOWER MALVERN RD., GLEN IRIS, S.E.6, VICTORIA

Phone: UL 5510.

#### MORSE PRACTICE TRANSMISSIONS

The following transmissions from the official W.L.A. stations are given on 3,504 Kc. on the days and times shown below—

Sunday—VK3WJ, 2030 to 2100 hours E.A.S.T.  
Monday—VK3WJ, 2030 to 2050 hours E.A.S.T.  
Tuesday—VK4WJ, 1930 to 2000 hours E.A.S.T.  
Wednesday—VK6WJ, not operating at present.  
Thursday—VK3WJ, 2030 to 2050 hours E.A.S.T.  
Friday—VK7WJ, 2030 to 2100 hours E.A.S.T.

#### FEDERAL QSL BUREAU

RAY JONES, VK3RJ, MANAGER

Congratulations to Noel, VK9NR, on the arrival of a fine daughter, born towards end of August, on location at Norfolk Island. Nice going Noel, there is a distinct possibility of Noel moving in the near future, QSL Managers and others are advised not to send further cards to Norfolk Island QTH, but to hold them until Noel's future location is decided. It may be VR2.

Frank Clarke, VK3CJ, of Ouyen, who visited Melbourne during August, is also to be congratulated on the safe arrival of another junior VL, now making the splendid mixed total of five.

An event which was scheduled to take place a few months ago and which had all Australian Ham friends with excitement was the projected phone contact between Jim VK3YC and Dave VK2EO. This arrangement was due to take place in Melbourne and arrangements had been completed to clear all adjacent channels and the ringside seats were filled in capacity, but also, at the last moment the power failed in Jim's moderator (7) unit and the project instead of regarding this providential happening as the writing on the wall and abandoning the project, the two conspirators decided to make a bigger phone contact. Advance information will be published in these columns.

From Fred Haas, VK5FH, came advance results of the R.E.R.U. on 21st August, but a shade too late for inclusion in the September issue of "A.R." in case the information is not published elsewhere, here it is as received by VK3RJ from VK5FH. Senior: VK3DI, GSWP, ZLMB, ZLPA, ZL3JY, G6RH, GWSVZ, VE3KE, ZS6GI, G8RG, VK3EO, VK3RU, G5QD, ZL3JY, ZS6GI, G6GN, ZS6CI, G8PB, VK2RA, VK5FH. The winner, VK5FH, amassed 2,368 points, while the 20th place, VK5FH, totalled 154 points. In the Junior section the following positions were obtained: 1st, VK3QJ, VK2QJ, 3rd ZM4AD, 5th VK4TY, 9th VK3UM, 10th VK5RX.

A complaint from OEIAD that no QSLs appear on many 10 QSLs received. As QSLs appear to mean so much to these Europeans, please chaps do the right thing and acknowledge his QSL.

Report to chaps that Jack, VK3JJ, was, during August, set upon by four thugs who in the usual wolf pack manner battered him, breaking an arm, one rib and blackening both his eyes in addition. Jack, however, was not hurt, having been re-set, Jack is now improving and would relish the opportunity at a later date of meeting each of the bather gang on even terms. If that opportunity is given Jack, my money goes on him.

McBourne Hams were pleased to greet "Bo" Williams, VK5BO, on a short visit to our City during early August. "Bo" is to be heard thrice weekly on 14 Mc. keeping skeds with that ardent and interesting personality "A" Williams, VK3JJ. Felix, FK3AC, in Queensland the writer states that there is only one other active Ham in Noumea being himself and that is FK3AB. A third, FK3AA, has a licence but has not come back yet. FK3AD at Tontouta Airfield also has a ticket but has not finished his rig as yet. Felix adds that FK3AD will make a good contact when the dog gets on as his operating ability is above average. The QTH of FK3AC is Felix Franchette, Box 164, Noumea, New Caledonia.

Welcome back to the air to Neil Hart, VK5XY, who after 13 months in hospital has been so far restored to health that he is able to periodically take up his old hobby. My R.A.F. associations with Neil have assured me of his ability.

Any VK who sought HSL1A and did not receive a card may obtain one by advising W6DLX, ZL3J, Jeffress St., Vallejo, Calif., U.S.A. A complete log has been retained, try outa will meet the fee they deserve.

ZS182, complains that he is not receiving VK cards back in near the numbers that he sends, being a 100 per cent. QSL man. Do not let our International reputation down, please chaps.

A chap in Lima, Peru, who desires to swap postcards with anybody in VK is—S/Sgt. Lee Perotti, U.S. Mission to Peru, U.S. Embassy, Lima, Peru.

HZ1KE, via VK3FH, advises that from now until further notice he will be operating on 3515 Kc. each Friday, Saturday and Sunday at 1900, 2100, and 0100 hours G.M.T. He is specially looking for VK and ZL contacts. The two latter times seem to be rather late for VK, but the first at 5 a.m. E.A.S.T. may prove to be successful for the 80 metre gang.

A request has been received for the publication of the QTHs of the State QSL Managers—

VK3—Jim Corbin, 78 Maloney St., Eastlake, South Aus.  
VK3 (Inwards)—Graham Roper, 36 Lucas St., Caulfield, S.E.8.  
VK3 (Outwards)—Frank O'Dwyer, 190 Thomas St., Hampton, Vic.  
VK4 (Inwards)—Eric Lake, Old Cleveland Rd., Camp Hill, Brisbane.  
VK4 (Outwards)—Campbell, 30 Prospect Terrace, Kelvin Grove, Brisbane.  
VK5—George Luxon, 8 Brook St., West Mitcham, South Aus.  
VK6—Jim Rumble, Box F319, Perth, West Aus.  
VK7—T. A. Allen, 6 Thirza St., Newtown, Tas.  
Federal—Ray Jones, 23 Landale St., Box Hill, E.11, Vic.

#### NEW SOUTH WALES

The August meeting of the N.S.W. Division was held at Science House, Sydney, on Friday, 26th August. The meeting commenced at 7.30 with the Extraordinary General Meeting which was held to consider certain amendments to the Articles of Association. So much discussion developed that an adjournment was made till September. The General Meeting which followed consisted of the reading of the lecture set down for the evening. The subject was "Selsyn Indicators and Their Uses," given by Mr. Ray Howe, VK2AH, who proved of great interest to all members, especially those who had purchased the units.

Our new baby, the Library, is growing apace and will have numerous new periodicals on its yet to be constructed shelves!

#### NORTH SHORE ZONE

Very little to report this month, due to other activities taking up almost the whole of my time. Unfortunately, anyway, it's Lb. weather, and DX seems to be improving slightly, which could be all to the good for the forthcoming contest. It is no, repeat NO, fun to try and maintain interest in a contest when the shack is like the interior of a refrigerator.

2AGN has been fairly busy on the air whilst his ship was in port. 2TT heard once again with his usual f.b. and 2TTI, who was in the beam, and is also planning to re-build his dual as a bind-switching doohickey—pity you can't hand-switch a beam we've been working on. 2AGN, using another beam, 2OG believed to be tinkering with the idea of installing a Q5-er on his Q3-er. No further selectivity, no eliminate everything but thermal noise soon, George, 2AGN, no more but his old receiver, but is likely to pop up with something spare before long. 2JG very quiet of late—going some away, Noel's 2N's beam still down for repairs.

#### WESTERN SUBURBS ZONE

Power restrictions appear to have put a damper on a revival of the local scene, but the enthusiasts won't be beaten. 2MQ has just got his new rig working on 6 metres and from Bill's description it sounds a honey. 2VP has foreseen 20 metres for the thrills of 6, being lured by the afore-said 2MQ. They tell me your n.b.f.m. sounds great Ron! 2AHU is tickled pink with his operating set-up, even to talk, etc., and can Curley talk! Needs no prodding. 2FG was going great guns on 20 until stonkered by power cuts. 2ADA promised action on 20 soon, but no signs of life as yet. 2TD has been a bit high on the air, but has been and getting married. His hamming must be jamming. 2BF should have that quadruple conversion super going in a few days. 2AGN is going to 44 and 2DW, haven't heard you lately Joe! New modulator coming up?

The Gladesville Radio Club, VK1ADY, has arranged a number of lectures and more evenings of popular interest are planned. Mr. J. Reed, VK2JZ, gave an interesting lecture on 1st Sept., the subject being "Frequency Modulation and the 'A' Antenna." A Field Day on 14th Mc. is planned for 18th Sept. and it is to be the same novel type of microphone-finding contest as the one held on 9th October. It is devoted to a social outing and members will have a great time picnicking at Eden Park.

#### NEWCASTLE ZONE

Things have been very quiet, possibly due to power restrictions and poor conditions during the month. The most important news of the month is the marvellous emergency work done by 2KN and the Northern gang. All here in Newcastle offer their regards on a wonderful job well done. Three times in three months the Northern gang came to the rescue when the communications failed—becoming a habit—let's hope full recognition is given to the efforts of the Northern gang. As a small operation and has given phone away to catch up with some c.w., only way to get that commercial ticket Sherry. 2CJV very busy with the hospital and has been away for a long time. 2JG opening for the Hunter Branch and we are all expecting a big roll up. The gang are very pleased to be part of the W.L.A.

R.D. Contest was better supported this year. Stations operating in the Zone included 2ZC,



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2A4A, 2C1, 2PT, 2AMM, 2ANA, 2TE, 2PO; two highest scores should be 2ZC0 about 400 points and 2A4A 333 points, both having to operate during working hours with QRP. 2TF and 2APS both require a minimum of 200 points. If you are not sure you will be still 80 in G and E, 2AFS only home twice weekly, but things under control. Not much from 2AGD, have an idea he might be lying low for the VE-ZL Contest. 2BZ keeping Newcastle the main on the 80s on 2 and 4, and frequently on 20. 2C0, a 60 old time, in QY, said he has a nice signal and works through to Sydney. 2C1 frequently found on 40 and 80 with a nice signal too. New Ham and member of the W.I.A. is Norm, 2ANA, who burns a hole in the Mayfield air on 40 and 80. 2C2, a 20 dipole on 20 and 80 from VE was the first report.

2PT, of Stockton (DX man's paradise), works plenty of Ws with a fixed beam. 2AMM put up a good score in the R.D. Contest. 2TE has two nice beams working, three elements on 20 and four on 10 metres. They overlook the Pacific and Bert takes it all. 2HQ on 80, 40 and 10 and on the latter two bands has a fine beam. 2WU put up 2WU but with three elements on 20 mainly chases 20 metre DX. NII from 2IV, presumed still busy with exams. 2AHA has taken over the zone notes from 2FP, but is QRL while wrecking beams for a change of QTH. Is going out to Birmingham Georgia to verify 2AG's work. Will be worried by local QRM for 2000. The main reason for the change is to select a good location for the DX. No news of Maitland since the floods.

2KR listening on 6 and working 40, had a week-end with the boys at 2ARG. 2RU working the 144 Mc. rig, quite active on 50. 2AEZ has at last opened up on 60 Mc. using a folded dipole and hopes to have a beam up soon. 2AMU playing about with converters and active on 50 and 28 Mc. 2KZ is on the air again after an absence of two months, re-built part of the modulator and works 28 and 50 Mc.

2KF, besides 28 Mc., is going on 144 and looking for contacts, also did the trip to 2ARG. No news of 2TY or 2MK. 2PZ still busy on his disposal rig and maybe active soon. 2ALR is a new Ham to Cosmoek, was previously in flood area at Maitland. 2YO is active on 10 metre phone, how long remains to be seen, as he is running 40 Ma. grid mainly on a pair of 507s. 2XL working all bands, currently on 50 Mc. one new county in 2ZL. 2ADT should be on 144 Mc. with 829B soon, still battling along in 50 Mc. test which seems to have lost some interest. Jack reports 28 and 27 Mc. improving.

Last month I forgot to farewell VK2VS who left for England, he will be away for about a year and all the zone wish him the best. Not a great amount of news on the subject as the only details were received from a message from his workmates at 2CA where he has been working from the kitchen with plenty of second order effects. It is nice to see such co-operation, washing up and Ham Radio at the same time. 2OW, at Temora, is putting out a very fine signal and 2ALS not heard often, still keen on the Rugby League. Occ. has been with transmitter coupling, much improved quality and freedom from broad edge transmissions.

2FN heard during the R.D. Contest and appeared to be collecting plenty of points. 30Y heard only briefly but was extremely solid and extra f.b. quality from a carbon mike. A new station in Forbes is WYV-TV AT20, 3R AMR30 and a three element tower for 20 Y. John M. Moore, Jr. No news from the "Gong kang" but 2WF was chasing 40 metre DX. Would like one and all to send news along and also photos and we will endeavour to have them published in "A.R." Activity in the R.D. Contest was good and operating more interesting due to the fact. Congrats to the States that took a trophy and the same to 2FA for his good tally for VE1.

Things in his zone have nearly returned to normal now the power restrictions have been eased. We have two new Hams in the persons of DS Kelly at Parkes, VK2ZAF, who is using p.p.s. 807s and 6X4s, and John Meagher at Forbes, NSW, ZS504; the other, John Meagher at Forbes, NSW had a shock warning with 2NS, 2W1L, 2B7, 2JH and ZAAF, John runs an 807 line up on 40 and 80 meters, he has a fine collection of vacuum tubes coming quite popular, 2VC, 2DR and 2ACU run one and are laud in their praises. The Dubbo gang are apparently in recess, 2AMR and 2AGT heard on 40, they are running three elements on 20 working satisfactorily and have raised a few dollars. 2JW and 2ALX are still working on the A.S.C. to end all suppressed carriers, they maintain it can be done with about six tubes, wish you luck boys. I don't see if you improve. 2YK and 2G and so sees the old stalwarts again. 2LY making terrific noise on 40, sounds as if the big rig is on at last. 2IIZ been taping a v.l.o. for weeks, 2YK has a fine 2A3, 2YK has a fine 2A3, 2YK is still using 144 MC, while 2FH has been heard on 80.

Much midnight oil was burnt during the organisation and planning of this Division's exhibit at the All Models Exhibition which ran from 27th August to 3rd September, 1949, and held in the Exhibition Buildings, Melbourne.

First obstacle to be overcome was the erection and placement of suitable antennae for all bands. Obstacle is the correct word, as the height of the roof (which incidentally is corrugated iron) is 100 feet for the main building. To get the size and shape of the building, it is in the shape of a "T" with a dome rising from the centre of the "T" over the base of a tower 80 feet above the main roof to a height of over 100 feet. Main floor of the building is 82,000 square feet. Several other buildings adjoin this main building and one of these was utilised as is mentioned later.

Two 2-metre dipoles were erected at right angles to one another approx. 30 feet apart at the base of the dome (150 feet high), connected to the transmitter by 264 feet of co-axial cable.

A 6-metre dipole was mounted on a flagpole about 150 feet high at the western end of the building with a run of 200 feet of 75 ohm twin lead.

A 10-metre "plumbers' delight" four element beam was mounted atop a 3 element close-spaced 20 metre beam on an 8 ft. tower on the main stand, the base of the tower being 14 feet above floor level. These beams were not used during the Exhibition, being kept in rotation by a 24 volt d.c. motor continuously throughout the day.

A vee beam with 8 wavelengths (540 feet approx.) in each leg was erected with the high end at the base of the vee, tied to the small room on top of the dome. From the high end, one wire was run fixed, one atop of a street lamp post 25 feet high (permission duly sought and granted!), the other to a tower on the nearby Museum about 50 feet high. The wire used was 11 gauge hard drawn copper, and has stood up quite high velocity winds. This wire, towards U.S.A. and Europe, was coupled to the transmitter by means of a 300 ohm line about 350 feet long.

80 and 40 metre folded dipoles made from 300 ohm line were strung from the other side of the room at the top of the dome to a flagpole 50 feet above the main roof, end to end with about 20 feet between them. These antennas did not stand up to high winds, the ribbons of the 80 metre antenna twisting off the length, the structure of the junction. After coming down, twisted wire ran a halyard for the entire run in order to support them, but only had time to string up the 40 metre dipole prior to the opening of the Exhibition.

To help display the simpler type of hammock, an 80 metre single wire fed antenna was strung inside the building, 10 metres above the floor. So much for antennae. It does not matter, though, that this occupied much tramping up and down the steps and stairs and clambering up and down the ladders to the large antenna in the roof of the building. The main attraction(?) of anchoring antennae to the room at the top of the dome was the climbing and the tramping up and down the ladders to the bottom of a 60 foot vertical ladder with rungs spaced 2 feet apart. This had to be done to "free" the antenna from the shackles of the dome, with the wind plucking pretty madly at you as the author well knows. This, at almost vertical stairs lead to the "room" which was about 10 metres high, because the antenna was to be entering through a trap door being only wide enough for one shoe to fit, well? We ask you—

All this work was carried out in the few weeks' notice we had prior to the Show. In order to familiarise ourselves with conditions pertaining at the location, many tests had of course to be carried out. 2, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536,

Erection and design of the stand was our next problem. Due to our last-minute participation—our exact location was not fixed until about ten days before opening day, Jack Groves did a remarkable job as all who saw it will agree; the result of his work being a most agreeable presentation of Amateur activity. The stage of the Exhibition was a very awkward setting, being 40 feet deep at the centre (almost "U" shape), 50 feet across, and 20 feet deep at each side.

Two metre continuous operation throughout the Exhibition provided some interesting contacts, but no unusually long distances were covered. A mobile station, operating over the whole metropolitan area, provided some unusual sidelights and much public interest. Contacts were also had with a "walkie-talkie" in the building. "Walkie-talkie" also had contacts up to 5 miles outside the building on a

Six metres, likewise continuous operation, also made many contacts but no interdate contacts. Also experienced difficulty with harmonics from other transmitters.

Ten metres.—Good DX was worked, utilising the 20 metre ve beam, but band could not be used much owing to poor conditions at various times.

Twenty metres.—Continuous operation, when not on 10 metres, provided contact with 18 countries and W.A.C. Public interest, stimulated by several We making recordings of transmissions, played back and put over p.s. system.

Forty metres.—Very little operation on this band as a transmitter was not available until the last two nights. No operation was made on 80.

Considerable electrical noise from the ignition of some of the model speed boats, cars, and aeroplanes also model railroads and a.c. motors on other stands caused us no little worry. However, over 60 contacts were made over the period of the Exhibition.

The television display caused a great deal of interest, but the picture presented was an image of Abraham Lincoln provided by a Pharmajector, a device used for the occasion by the Melbourne Technical College. The image, which was shown in closing days as an iconoscope, was not available, although arrangements were made to have two flown out from U.S.A. and they were still en route at the close of the show. However a running commentary over a small p.a. describing the apparatus (constituting 50 tubes) was given and make-up of raster, etc. was demonstrated so that the public could get some idea of just "how it is done." The r.f. power supplies provided the necessary h.t. to the "camera" receiver, a.o. illuminating the raster and the a.r.o. projecting the final picture.

Outside electrical and radio interference did not upset the final picture although slight interference was experienced. The interference was caused to some extent by the use of the same frequency by some of the various receivers on the same frequency. A serious and some experimentation could have obviated the trouble if it had been bad. We know that many, many hours were spent on this apparatus. The boys were very anxious to get to the ground and in contact with the public in the body of the ship and helped to draw the crowd when it got there, also to locate missing persons and articles. The boys who were invited the show and the show should have been about 30 minutes. The boys rang at 8.30 and he eventually found his way home. Then the brother Ham tuning up the 20 meter transmitter doled around holding the mike and the boys and claimed there was no modulation.

Argument resulted as to whether one or both lamps of a twin lamp indicator should light when the transmitter and antenna are properly coupled. These twin lamps really work—try it and see—only the lamp nearest the transmitter should light.

The 40 meter transmitter nearly caused a fire when a metal-cased meter arced over to a steel panel, burning up relay contacts. The flames rose 2 or 3 inches and three people made separate dives to switches, local distributing board and fuses, and main switch—all located several feet apart. Result was that a great yell came from all the operators: "Hey! We're off the air." Somebody else went crook because all the clocks stopped and had to be started again.

20 metres was dead one night until a W.L. c.w. operator got on the mike; you should have heard the Ws fighting for a contact—she not being used to phone had to hand over to an OM before long.

The lad who saw the commercial television receiver, with the tube showing a few lines, remarking, "You should see the television set—it's gone blue in the face." And the sweet young lady who said, "Do you know Mrs. —, she works at the factory which advertises on the front page of

Using the 300 ohm line to provide 230 volts? for an iron to solder leads to the vee beam on top of the dome and running the Dom V. via the 2 1/2 meter beam for communication. Also the cockatoo's laughing at Hama on roof!!

Also the man of 75 who had known of radio since it was considered witch-craft in England.

The television picture was altered in horizontal gain to show different faces. Of course we just had to have a visit from a B.B.C. engineer to put it through its paces—we won out.

In conclusion, the Exhibition Committee are

really appreciative of the fine assistance given them by the general member, both "old faithfuls" and some new faces. This assistance was at times overwhelming and helped to make our exhibit the outstanding one of the whole show. No names have been mentioned as it was impossible to know who provided the most assistance.

We have learnt many lessons, the main one being that the average Ham is never prepared for a show such as this. Much planning is required to present



Amateur Radio to the public who don't know who or what we are, except a lot of cranks who burn midnight oil. All our gear should be suitably labeled, such as what this knob or that switch is for, which tube goes in which socket, what is a.c. inlet and d.c. outlet, what voltages are used and which contact is which on tag strips. You never know when someone else may have to use your set-up in an emergency.

Which brings us to another point. What would you do in a state of emergency, such as flood, etc. Some of the transmitters, etc., could be operated from primary supplies from what we could see, but we repeat, are you ready?

Well, chaps, we do hope we haven't left anything out from this description, but look forward to your active participation in the next Exhibition.

A special QSL Card with photo of stand will be sent to all stations contacting VK3WI during the Exhibition.

#### SOUTH WESTERN ZONE

Latent news is that the South Western gang are going to hold their Convention about the 19th and 20th of November in Ballarat, but chaps listen to 3WJ for further details.

The Geelong gang seem to be doing a bit of DX, as 3VF has a long wire up and 3IC has worked 1ADS. 3BW has Type A Mark III on 80, and 3CM has been working 2Ls with 3 watts. 3W has a Type 3 Mark II, now and running high power of 10 watts. 3ALG has mike trouble, but OK now so I hear, and Fred hopes to have new modulation transmits going soon. 3ARE will not work on 2, 3 or 7 Mc, now, what's the trouble Ed! 3BU has tried out some n.b.f.m.

3GH has f.b. phone now. He, 3VH, 3VA, and 3BI went down to see the gang at the Exhibition. 3BE has a new power trans and hopes to be on soon. I wondered if the YLs in Ballarat had you cornered Andy. Was sorry to hear that 3ALM had a serious operation, best of health Lloyd old pal. Have not heard 3JA or 3EG on of late, but Jack has been off due to the children being sick with some woz.

3DX has the prop motor on his beam, so it won't be long now. Had a yarn with 3EQ the other day; Norm, by the way, seems to like the idea of riding on the old grid, he tells me that it saves his legs! Have not heard 3ZU on of late, what's the matter Frank, must be the football. 3PS has

had a spell with the flu. 3HF has everything under control, seeing that he has a nice YL in the shack talking to the Ws and VEs. Heard Vern on the other day with a better signal, also 3ARR and 3AGD. By the way John, what have you done to 3IL, it seems as though you gave Leigh a dip in his duck pond.

**Geelong Amateur Radio Club.**—An interesting Lecture was given by club member Jack Mitchell on "Pulse Modulation." Jack used drawings to illustrate his lecture. The following club night some of the members travelled to Melbourne to see the display of gear at the Models Exhibition by the W.L.A. Many old and new friends were made there. 3ALG met an a.w.l. whom he had not seen for approx. 13 years. Alf Forster has started on a Radio Course for members on Monday nights following the Wednesday meeting. This should be very interesting as it progresses and a good roll up is expected on the Monday nights before the course has gone very long.

#### EASTERN ZONE

Those members of the zone who were fortunate enough to visit the Models Exhibition all voted it a great success, though we are a bit concerned in case our worthy secretary deserts Ham Radio in favor of Model Trains!

Lindsay, 3OI of Stratford, is working a bit, and expects to join in the age hook-up very soon. Rumours say that Graham, 3UD is suffering from a bad attack of YL trouble, which threatens to develop into XYL trouble shortly. We all hope he will be able to join in our hook-ups after the event. Graham has been busy studying, with the result that he has passed the P.M.G. Technician's exam. Ron, 3LY, and Howard Vining are shift technicians at 3GL. Ron is building a new home, and has an impressive 65 feet vertical made of water pipe. When are you going to connect a rig to it?

Jack, 3AAL, is in Melbourne still at a P.M.G. Technicians' School. 3AAL, Ted, is on 40 metres with an ATG/ARS. 3ANC has been holidaying at Maffra for three weeks. 3WE has been commended by D24 for his recent work when Omeo and District were snow-bound. 3AIC, Doug, has been visiting 3DIs shack of an evening, discussing v.h.f. work with Jim and 3VL. Doug will soon be on from Leongatha. 3VL has been operating his low power emergency set-up from bed, and, besides,

whilst taking it easy after an experimental eye operation. 3US has been setting the rig up for 3VL. 3PR lost his newly-erected poles in a wind storm. Syd, 3CL, is active on 80; paid a short visit to 3UL of Tatura. Eric, 3ACI, is experimenting with n.b.f.m.

#### NORTH EASTERN ZONE

As usual no dope from anybody on their radio activities, and from listening everyone must be doing other things, as no N.E. signals heard. The correspondent's staff has been further increased. Mr. Brown, Tee Associate, is sending in anything tasty he hears of. 3JK has had Riley up to 90 m.p.h. 3HP has new Chev. 3APF not game to try MG over 49. 3TS thinking of having Chev. rebored, as speed is down to 70. 3ABG has just run in new motor, after blowing up old one. Top speed only about 85. An MG is on order.

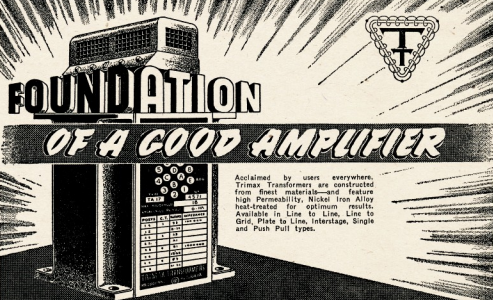
3TS has another 3TS rig going but waiting on new 2 L.W. alternator before going really QRO. 3TY back on his feet after months in bed, but not on the air much yet. 3APP has QRP 850 rig on six. 3AT working on f.m. rig. 3UT did well in R.D. Contest. 3GD changing QTH again. Buy a caravan George. 3ACK heard on forty. 3APP bought a new mike.

#### QUEENSLAND

The September monthly meeting was held in the new rooms in the Y.M.C.A. Buildings. There were 33 members present. The President JAW welcomed a visitor VEKDE. Two Council reports were presented and this was followed by a long discussion on "Amateur Radio." Everyone present seemed to have something to say on the subject, as members published in the magazine. The business side of the meeting having been dealt with, an article by 4FN, "Putting S.S.S.C. To Work," was read by the Secretary.

#### ZONE NEWS

Downs Zone (4CG).—LUX finding it hard in the Granite Belt. DX should be "fruit" up Stanthorpe way. Solid tower and chopping up beam.



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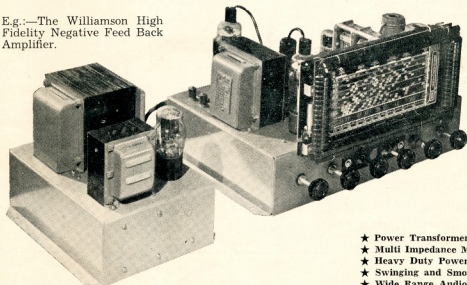
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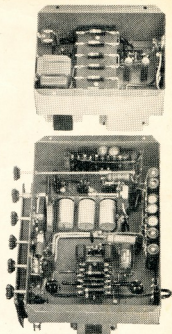
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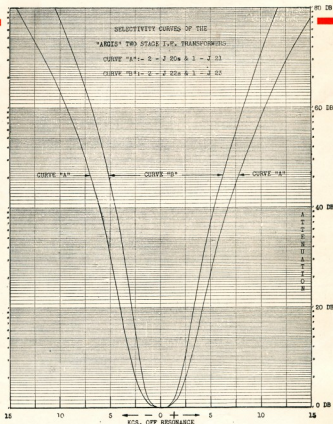
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